CLAIMS

1. A radio communications apparatus which constructs an ad-hoc network with other radio communications apparatuses existing therearound to wirelessly communicate with the other radio communications apparatuses using a TDD-CDMA system, and wirelessly communicates with base station equipment of a mobile communications network using the TDD-CDMA system; the radio communications apparatus having a first communications path for directly communicating with the base station equipment and a second communications path for communicating with the base station equipment via another radio communications apparatus within the ad-hoc network, as communications paths to the base station equipment, and communicating with the base station equipment using a communications path specified by the base station equipment among the first communications path and the second communications paths.

2. A radio communications system comprising:

base station equipment of a mobile communications network; and

a radio communications apparatus which uses a TDD-CDMA system for communications with the base station equipment and uses the TDD-CDMA system common to the communications with the base station equipment and the same frequency band for communications with other radio communications apparatuses within an ad-hoc network; wherein

when a communications path for directly connecting the radio communications apparatus and the base station equipment is assumed to be a first communications path and communications paths for connecting the radio communications apparatus and the base station equipment via the other radio communications apparatuses within the ad-hoc network are assumed to be second communications paths,

the base station equipment comprises:

measurement means for measuring, for each of the first communications path and the second communications paths, power required for transmitting a signal and delay time required for the transmitted signal to reach a communication counterpart; and

communications path selection means for selecting at least any one of the first communications path and the second communications paths as a communications path to be used for communications with the radio communications apparatus, based on the measured values of the power and the delay time and notifying the radio communications apparatus of the selected communications path; and

the radio communications apparatus communicates with the base station equipment using the communications path notified by the base station equipment.

3. The radio communications system according to claim 2, wherein:

the communications path selection means determines, for each of the first communications path and the second communications paths, a function value of an evaluation function with the measured values of the power and the delay time as arguments, and selects at least any one among the first communications path and the second communications paths as a communications path to be used for communications with the radio communications apparatus, based on the result of comparison of the function values.

4. The radio communications system according to claim 2, wherein:

the communications path selection means excludes, when tolerance values are set for the power and the delay time in advance, such a communications path that at least one of the power and the delay time thereof exceeds the tolerance value.

5. Base station equipment of a mobile communications network which communicates with a mobile station, in the case where the mobile station is a radio communications apparatus capable of constructing an ad-hoc network with other radio communications apparatuses existing therearound to wirelessly communicate with the other radio communications apparatuses using a TDD-CDMA system, using the TDD-CDMA system common to the communications within the ad-hoc network; the base station equipment comprising:

measurement means for measuring, when a communications path for directly communicating with the mobile station is assumed to be a first communications path and communications paths for communicating with the mobile station via the other radio communications apparatuses within the ad-hoc network are assumed to be second communications paths, power required for transmitting a signal and delay time required for the transmitted signal to reach a communication counterpart for each of those communications paths; and

communications path selection means for selecting at least any one of the first communications path and the second communications paths as a communications path to be used for communications with the mobile station, based on the measured values of the power and the delay time and notifying the mobile station of the selected communications path.

6. A radio communications apparatus which constructs an ad-hoc network with other radio communications apparatuses existing therearound to communicate with the other radio communications apparatuses using any communications system of a TDD-CDMA system, a TDD-TDMA system and a multiple access system based on TDD-OFDM and wirelessly communicates with base station equipment of a mobile communications network using the same communications system and frequency band; the radio communications apparatus having a first communications path for directly communicating with the base station equipment and a second communications path for communicating with the

base station equipment via another radio communications apparatus within the ad-hoc network, as communications paths to the base station equipment, and communicating with the base station equipment using a communications path specified by the base station equipment among the first communications path and the second communications paths.

7. A radio communications system comprising:

base station equipment of a mobile communications network; and

a radio communications apparatus which uses any communications system of a TDD-CDMA system, a TDD-TDMA system and a multiple access system based on TDD-OFDM for communications with the base station equipment and uses the communications system common to the communications with the base station equipment and the same frequency band for communications with other radio communications apparatuses within an ad-hoc network; wherein

when a communications path for directly connecting the radio communications apparatus and the base station equipment is assumed to be a first communications path and communications paths for connecting the radio communications apparatus and the base station equipment via the other radio communications apparatuses within the ad-hoc network are assumed to be second communications paths,

the base station equipment comprises:

measurement means for measuring, for each of the first communications path and the second communications paths, power required for transmitting a signal and delay time required for the transmitted signal to reach a communication counterpart; and

communications path selection means for selecting at least any one of the first communications path and the second communications paths as a communications path to be used for communications with the radio communications apparatus, based on the measured values of the power and the delay time and notifying the radio communications apparatus of the selected communications path; and

the radio communications apparatus communicates with the base station equipment using the communications path notified by the base station equipment.

8. The radio communications system according to claim 7, wherein:

the base station equipment includes a base station and radio network controller equipment for controlling the base station;

the other radio communications apparatuses in the ad-hoc network include a first ad-hoc terminal capable of wirelessly communicating with the base station and a second ad-hoc terminal capable of communicating with the radio network controller equipment via a wired communications network; and

the second communications paths include a communications path for connecting the radio communications apparatus and the base station via the first ad-hoc terminal and a communications path for connecting the radio communications apparatus and the radio network controller equipment via the second ad-hoc terminal.